

## § 23.203

## 14 CFR Ch. I (1–12 Edition)

(e) Compliance with the requirements of this section must be shown under the following conditions:

(1) *Wing flaps*. Retracted, fully extended, and each intermediate normal operating position.

(2) *Landing gear*. Retracted and extended.

(3) *Cowl flaps*. Appropriate to configuration.

(4) *Power*:

(i) Power off; and

(ii) 75 percent of maximum continuous power. However, if the power-to-weight ratio at 75 percent of maximum continuous power result in extreme nose-up attitudes, the test may be carried out with the power required for level flight in the landing configuration at maximum landing weight and a speed of  $1.4 V_{SO}$ , except that the power may not be less than 50 percent of maximum continuous power.

(5) *Trim*. The airplane trimmed at a speed as near  $1.5 V_{S1}$  as practicable.

(6) *Propeller*. Full increase r.p.m. position for the power off condition.

[Doc. No. 27807, 61 FR 5191, Feb. 9, 1996]

EFFECTIVE DATE NOTE: By Amdt. 23–62, 76 FR 75755, Dec. 2, 2011, § 23.201 was amended by revising paragraph (d), by revising and redesignating current paragraph (e) as paragraph (f), and by adding a new paragraph (e), effective Jan. 31, 2012. For the convenience of the user, the added and revised text is set forth as follows:

### § 23.201 Wings level stall.

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(d) During the entry into and the recovery from the maneuver, it must be possible to prevent more than 15 degrees of roll or yaw by the normal use of controls except as provided for in paragraph (e) of this section.

(e) For airplanes approved with a maximum operating altitude at or above 25,000 feet during the entry into and the recovery from stalls performed at or above 25,000 feet, it must be possible to prevent more than 25 degrees of roll or yaw by the normal use of controls.

(f) Compliance with the requirements of this section must be shown under the following conditions:

(1) *Wing flaps*: Retracted, fully extended, and each intermediate normal operating position, as appropriate for the phase of flight.

(2) *Landing gear*: Retracted and extended as appropriate for the altitude.

(3) *Cowl flaps*: Appropriate to configuration.

(4) *Spoilers/speedbrakes*: Retracted and extended unless they have no measureable effect at low speeds.

(5) *Power*:

(i) Power/Thrust off; and

(ii) For reciprocating engine powered airplanes: 75 percent of maximum continuous power. However, if the power-to-weight ratio at 75 percent of maximum continuous power results in nose-high attitudes exceeding 30 degrees, the test may be carried out with the power required for level flight in the landing configuration at maximum landing weight and a speed of  $1.4 V_{SO}$ , except that the power may not be less than 50 percent of maximum continuous power; or

(iii) For turbine engine powered airplanes: The maximum engine thrust, except that it need not exceed the thrust necessary to maintain level flight at  $1.5 V_{S1}$  (where  $V_{S1}$  corresponds to the stalling speed with flaps in the approach position, the landing gear retracted, and maximum landing weight).

(6) *Trim*: At  $1.5 V_{S1}$  or the minimum trim speed, whichever is higher.

(7) *Propeller*: Full increase r.p.m. position for the power off condition.

### § 23.203 Turning flight and accelerated turning stalls.

Turning flight and accelerated turning stalls must be demonstrated in tests as follows:

(a) Establish and maintain a coordinated turn in a 30 degree bank. Reduce speed by steadily and progressively tightening the turn with the elevator until the airplane is stalled, as defined in § 23.201(b). The rate of speed reduction must be constant, and—

(1) For a turning flight stall, may not exceed one knot per second; and

(2) For an accelerated turning stall, be 3 to 5 knots per second with steadily increasing normal acceleration.

(b) After the airplane has stalled, as defined in § 23.201(b), it must be possible to regain wings level flight by normal use of the flight controls, but without increasing power and without—

(1) Excessive loss of altitude;

(2) Undue pitchup;

(3) Uncontrollable tendency to spin;

(4) Exceeding a bank angle of 60 degrees in the original direction of the turn or 30 degrees in the opposite direction in the case of turning flight stalls;

(5) Exceeding a bank angle of 90 degrees in the original direction of the turn or 60 degrees in the opposite direction in the case of accelerated turning stalls; and

(6) Exceeding the maximum permissible speed or allowable limit load factor.

(c) Compliance with the requirements of this section must be shown under the following conditions:

(1) *Wing flaps*: Retracted, fully extended, and each intermediate normal operating position;

(2) *Landing gear*: Retracted and extended;

(3) *Cowl flaps*: Appropriate to configuration;

(4) *Power*:

(i) Power off; and

(ii) 75 percent of maximum continuous power. However, if the power-to-weight ratio at 75 percent of maximum continuous power results in extreme nose-up attitudes, the test may be carried out with the power required for level flight in the landing configuration at maximum landing weight and a speed of 1.4  $V_{SO}$ , except that the power may not be less than 50 percent of maximum continuous power.

(5) *Trim*: The airplane trimmed at a speed as near 1.5  $V_{S1}$  as practicable.

(6) *Propeller*: Full increase rpm position for the power off condition.

[Amdt. 23-14, 38 FR 31820, Nov. 19, 1973, as amended by Amdt. 23-45, 58 FR 42159, Aug. 6, 1993; Amdt. 23-50, 61 FR 5191, Feb. 9, 1996]

EFFECTIVE DATE NOTE: By Amdt. 23-62, 76 FR 75755, Dec. 2, 2011, § 23.203 was amended by revising paragraph (c), effective Jan. 31, 2012. For the convenience of the user, the revised text is set forth as follows:

**§ 23.203 Turning flight and accelerated turning stalls.**

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(c) Compliance with the requirements of this section must be shown under the following conditions:

(1) *Wings flaps*: Retracted, fully extended, and each intermediate normal operating position as appropriate for the phase of flight.

(2) *Landing gear*: Retracted and extended as appropriate for the altitude.

(3) *Cowl flaps*: Appropriate to configuration.

(4) *Spoilers/speedbrakes*: Retracted and extended unless they have no measureable effect at low speeds.

(5) *Power*:

(i) Power/Thrust off; and

(ii) For reciprocating engine powered airplanes: 75 percent of maximum continuous power. However, if the power-to-weight ratio

at 75 percent of maximum continuous power results in nose-high attitudes exceeding 30 degrees, the test may be carried out with the power required for level flight in the landing configuration at maximum landing weight and a speed of 1.4  $V_{SO}$ , except that the power may not be less than 50 percent of maximum continuous power; or

(iii) For turbine engine powered airplanes: The maximum engine thrust, except that it need not exceed the thrust necessary to maintain level flight at 1.5  $V_{S1}$  (where  $V_{S1}$  corresponds to the stalling speed with flaps in the approach position, the landing gear retracted, and maximum landing weight).

(6) *Trim*: The airplane trimmed at 1.5  $V_{S1}$ .

(7) *Propeller*: Full increase rpm position for the power off condition.

**§ 23.207 Stall warning.**

(a) There must be a clear and distinctive stall warning, with the flaps and landing gear in any normal position, in straight and turning flight.

(b) The stall warning may be furnished either through the inherent aerodynamic qualities of the airplane or by a device that will give clearly distinguishable indications under expected conditions of flight. However, a visual stall warning device that requires the attention of the crew within the cockpit is not acceptable by itself.

(c) During the stall tests required by §§ 23.201(b) and 23.203(a)(1), the stall warning must begin at a speed exceeding the stalling speed by a margin of not less than 5 knots and must continue until the stall occurs.

(d) When following procedures furnished in accordance with § 23.1585, the stall warning must not occur during a takeoff with all engines operating, a takeoff continued with one engine inoperative, or during an approach to landing.

(e) During the stall tests required by § 23.203(a)(2), the stall warning must begin sufficiently in advance of the stall for the stall to be averted by pilot action taken after the stall warning first occurs.

(f) For acrobatic category airplanes, an artificial stall warning may be mutable, provided that it is armed automatically during takeoff and rearmed automatically in the approach configuration.

[Amdt. 23-7, 34 FR 13087, Aug. 13, 1969, as amended by Amdt. 23-45, 58 FR 42159, Aug. 6, 1993; Amdt. 23-50, 61 FR 5191, Feb. 9, 1996]